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A CASE STUDY OF HABITAT FOR HUMANITY

BY

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A REPORT PRESENTED TO THE GRADUATE COMMITTEE OF THE DEPARTMENT OF CIVIL ENGINEERING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ENGINEERING

UNIVERSITY OF FLORIDA

SUMMER 1994

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ACKNOWLEDGMENTS

I would like to take this opportunity to express my sincerest thanks to all of the professors that I have studied under at the University of Florida. I would also like to thank the rest of the masters students and all the volunteers at the Alachua Habitat for Humanity chapter for their help in making it such a fun year.

Finally, special thanks to my wife, Deborah ,and two sons, Benjamin and Eli, for their continued support in what ever I do.

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CHAPTER 1
INTRODUCTION

The practical field use of the concepts and techniques that are learned in the classroom was a prime factor in selecting a topic for this report. The possibility of working for a contractor was interesting but volunteering with the Alachua Habitat for Humanity chapter allowed even more flexibility. Since Habitat for Humanity uses volunteers to build houses there was the opportunity to spend time learning how to physically layout a house, frame walls, or put on a roof, and learning how to build a house has greatly expanded my practical construction knowledge. Being a non-profit organization they were also very amenable to the time consuming process of asking questions, and taking surveys, which was necessary to get a good idea of what was going on. Finally, the time spent building is for a good cause and I feel that the community is a little better off for my passing through.

There are several organization specific problems that would not be applicable to a profit driven company but the similarities outweigh the differences. The problems that Habitat for Humanity has in productivity, scheduling, site organization, material deliveries, and quality are all valid issues that anyone who is involved in construction has to address. A large portion of time was devoted to studying the organization to find out how they currently operate and where the general problems were. Chapters 1 and 2 give an overall summary of the organization. Chapter 3 gets into specific construction related issues and how most of the time in the field was spent. Productivity indicators were used to get a

better feel for Habitat for Humanities construction process and to get some practice actually using the techniques. A portion of Chapter 3 was used to give a brief background on these techniques because they do not seem to get a lot of exposure. They are quite useful and should be used more often on all construction sites. Recommended solutions to the problems are discussed in Chapter 4 followed by the conclusions in Chapter 5.

CHAPTER 2
HISTORY/BACKGROUND

2.1 History of Habitat for Humanity

The Alachua Habitat for Humanity chapter is a part of the main Habitat for Humanity organization whose headquarters are located in Americus Georgia. It was founded in 1976 by Millard Fuller, an attorney and former millionaire, who gave up his material possessions to make shelter a matter of conscience. There are now over 1000 independent affiliates located in every state of the United States and in over 40 foreign countries. In 1993 they were ranked by *Builder* magazine as the 17th largest home builder in the United States. They built over 2,700 homes in 1993 and in excess of 25,000 since their inception (1, pg. 176). The majority of the labor is done by volunteers with the most famous being former president Jimmy Carter. The local chapter was started in 1987 and has one full time director and one part time superintendent who are on salary. They currently have a production goal of five houses per year and want to double that as soon as possible.

2.2 How Habitat for Humanity Works

The basic idea behind the program is to give the working poor an opportunity to own a house. The potential homeowners must be dedicated enough to put in 100 hours of "sweat equity" building homes for others before putting 400 more into their own. This is one of the most important first steps because it gives the potential homeowners the confidence and knowledge to

fix/maintain their homes in the future. They are also required to pay for the cost of their home through a typical 20 year no interest loan with $500 down. The homeowners definitely do not get a free ride in any aspect of the program and are carefully screened to ensue that they are able to continue paying the mortgage once the house is built. Payment of the mortgages is critical because the building costs for subsequent houses are partially financed using the mortgage payments from the previous homes. To build the most houses for the money, and to reinforce the idea of volunteering to help your neighbor and community, Habitat for Humanity relies on a huge core of volunteers and donations. The idea is not just to build a house but to build a community.

The three to four bedroom (approximately 1050 sf to 1150 sf) homes are built using a mixture of volunteer labor and sub-contractors under the supervision of a site superintendent. The sub-contractors typically do the electrical, plumbing, heating, plastering, and large concrete/masonry parts of the house while the volunteers do everything else.

Land, donations, city interface, and overall coordination is handled by the main office. Habitat works closely with local governments in an effort to revitalize blighted inner-city areas. This arrangement works well for both sides since Habitat frequently gets free land that the city has condemned but can not get rid of because of its location. The city also benefits because the land goes back on the tax rolls and some of the worst areas are reclaimed.

CHAPTER 3
FINDING THE PROBLEMS

3.1 Productivity Indicators

The use of productivity indicators on a largely volunteer project may seem a bit strange because the results are fairly predictable. However, just going through the process allows time to become familiar with the system and to get a feel for the people. Three different ttechniques were tried to obtain an indication of productivity. The techniques are simple to learn and provides the engineer with a quick idea of construction progress. If an engineer develops the habit of taking time to systematically apply these techniques then he should have a better understanding for the projects he manages. They are actually so simple that he could do them himself each time he goes out to the job. If the project is too big then an investment in getting an independent firm to perform the surveys would be money well spent. A brief background on each technique is given below for clarification (examples of the work sheets are given in Appendix A):

3.1.1 Adjusted Field Rating Index

Field ratings require that the activity of workers be divided into two classifications, namely, working and not working. The basic rules are as follows:

1. Mechanical counters or a working form (See page A-1) is needed to record the crew's activity.

2. To the greatest extent possible, all those to be covered by the survey should be observed. At least 75 percent of the crew must be in the sample to get dependable results.

3. The observer should devote full time to the count while it is being made and avoid distractions of any kind. He should also be knowledgeable about the correct procedures.

4. The rating should be made the first instant of observation. The observer should not bias the result by speculating about whether or not the crew member was or will be active a moment before or after the observation.

5. To record normal activity for a project crew, counts should not begin until at least 1/2 hour after the workers start work or closer than 1/2 hour until quitting time or lunch. This rule should not stop the observer from taking special counts at the beginning and end of the day to see if activities get under way quickly or if activity tends to slack off just before quitting time.

6. No count should be discarded. To qualify as working the crew member should be engaged in activities like:

a. Carrying material or holding or supporting material

b. Participating in active physical work, including:

1. Measuring; laying out; reading blueprints; filling out time cards; giving instructions

2. Holding a tag line or supporting a ladder

3. Operating a piece of equipment, but only when actively engaged

c. Discussing the work (only if verified)

With these basic rules in mind the observer should find a place where he can see the entire crew without being conspicuous. He then begins the count and does not stop until the entire crew has been classified. The results of the

count will then be the total number observed and the total number classified as working. The percentage working is the number working divided by the total observed. To cover foremen and personal time, 10 points are added to the percentage to give an adjusted field-rating index.

The sample size taken for this project only gives an indication of probable conditions, additional ratings would have to be taken if this technique was to be applied to a large commercial project. The rule of thumb is that 100 observations can usually identify a problem; but that at least 400 observations are required to give reasonable certainty (2, pp. 176).

3.1.2 Labor-Utilization Factor

The argument that some contributory work is required in all jobs is the basis for the Labor-Utilization Factor. The work can be defined for almost all types of construction (2, pp. 180) as follows:

1. Effective work, or activities directly involved in the actual process of putting together or adding to a unit being constructed.
2. Essential contributory work, or work not directly adding to but essential to finishing the unit, such as handling material, cleanup, personal time, receiving instructions, or reading plans.
3. Not useful or idle work, or all other activities.

The actual field observation procedures are very similar to the above so they will not be repeated. Once the crew has been observed the Labor-utilization factor is found by adding the effective work total to one-fourth of the contributory work total and dividing the sum by the total observed. The total observed is the sum of the effective, contributory, and idle totals.

3.1.3 Five-Minute Rating

The 5-minute rating technique is so named because of the rule that no crew should be observed for less than 5 minutes (2, pg. 181). A rule of thumb is that the minimum observation time, expressed in minutes, should be equal to the number of the men in the crew. The purposes of the 5-minute rating are to (1) create awareness on the part of management of job delays and their magnitude; (2) measure the effectiveness of the crew; and (3) indicate where more thorough, detailed observations or planning could result in savings. This technique does not differentiate between delays which impede the progress of the job and those that which do not affect progress but merely indicate higher cost.

To make a 5-minute rating the observers, with a watch and form (See page A-3) for recording observations, must place themselves in a position from which they can observe a whole crew without being conspicuous. For small crews working close together , all are observed at the same time. Large crews can be mentally divided into sub-groups for ease of observation. Individuals in each group are then observed during consecutive blocks of time of from 30 seconds to several minutes, and the ratio of delay or non work to total observed time is noted. If the delay noted for an individual block of time exceeds 50 percent of the period of observation, then the rating for that individual is classified under delay. Conversely, if the delay is less than 50 percent, the appropriate block is classified as effective. The sum of effective times for each individual and for the crew divided by the total time of observation will then give an effectiveness ratio. When multiplied by 100, an effectiveness percentage for the whole crew is found. This is a somewhat subjective rating and the observer needs to try to be as consistent as possible when classifying a member of the crew.

As predicted each of the above techniques indicated low productivity rates and the results are tabulated in Table 3-1. While this was expected it does

highlight one of the major problems faced by Habitat for Humanity, how do you make sure that largely unskilled people are productively employed without knowing how many will show up to work, what their skill level is, or whether or not they will work where you want them to work. That last point is important because you can not make a volunteer do something they refuse to do.

Under most circumstances any productivity indicator is really a sampling of the quality of the management of a project, not the workers. While some allowances have to be given for the large non-skilled labor force on a Habitat project the volunteer work force can not be totally blamed.

Table 3-1, Productivity Survey Results

Productivity Technique	Actual Results	Comparison*
Adjusted Field Rating Index	42 %	60 %
Labor -Utilization Factor	37 %	55 %
Five minute Rating	59 %	70 %

* These are only rough comparisons for residential carpentry crews that were used in the BCN 5470, Construction Methods Improvement, class.

3.2 Building Criteria for Habitat Homes

The next step in learning the process was to review the general Habitat for Humanity home building criteria. Each Habitat chapter is given the flexibility to develop its criteria based on existing local building practices and code requirements. In an effort to keep costs down and to ensure that each family gets about the same "amount of house" there is a real effort to stick with the minimum requirements as spelled out in the criteria. The office manager coordinates getting the house plans drawn by a local architect or engineer (usually this service is donated) with this criteria as a guide. This review did not

provide any insight of problems caused by the criteria but was useful in understanding the standard they are building to in the field. A quick review of the criteria shows that the houses do not have very many frills but do provide more than adequate shelter. A copy of the building criteria is included as Appendix B.

3.3 Existing Schedule Analysis

The superintendents basically do all the project scheduling in their heads and send material and sub-contractor requirements to the main office each week. The superintendents have radically varied backgrounds and have generally learned to build through experience. They have all heard about bar charts and critical path diagrams but do not have the experience to develop the schedules themselves. This is not quite as bad as it sounds because there is only a two day (really a day and half) work week for on site construction. The short work week allows a lot of leeway for information to get passed. The goal in the field (at least informally) seems to be "finish as soon as we can" which is certainly nice but not very demanding.

Once the office gets the material/work requests they order the material through one of the local building material suppliers, try to match the requests to their donated supplies in the warehouse, or arrange with the appropriate sub-contractor to get out on the job. During the work days the superintendent also has the flexibility to send someone to the store for those small things that he may need and charge the purchase to an account. This system works but there are frequent work stoppages or slow downs because material delivery is not formally tied to a schedule. All this puts an added strain on the superintendent who is trying to keep all the volunteers busy.

3.4 Site/Job Organization

Each site usually has at least one material/tool trailer. The volunteers frequently show up with out any tools so there are quite a few basic hand and power tools available. The tools are managed by a long time volunteer who tries to ensure they are kept organized, and cleaned.

Work officially starts at 8:00 am when the superintendent arrives to open up the trailer. Habitat tries to have one superintendent for each house but this is not always possible. The number of people with the practical knowledge to build a house is small and only a fraction are inclined to volunteer their talents and Saturdays.

Volunteers show up at random times through out the day and the superintendent or volunteer coordinator (if available) tries to organize them based on their skill levels and then assigns them to a job as appropriate. Experienced personnel are selected to act as foremen in charge of largely unskilled crews. The supervisor tries to monitor each foreman and gives basic advice and direction as required. There is about an hour break for lunch (which is provided free to all the volunteers by Habitat) with work stopping about 2:00 pm. The early stop time is necessary to make sure there is enough time and volunteers to put everything back into the trailers. Most of the homes are built in poor areas of town and if everything is not put away it gets stolen or vandalized.

The amount of work done each day is hard to project based on this system and this often frustrates the supervisors. Underemployment is also common because the mix of skill levels, the number of people who show up, and the tasks that are being worked on that day do not match. This in turn frustrates the volunteers who often do not return.

Verbal communication is fairly good. There is a network of long time volunteers who spend an incredible amount of time coordinating the activities

behind the scenes. Unfortunately, since everyone is not using a common written schedule as a reference tool there has been some rather large miscommunication problems between the main office and the field. Most of the problems are material related which leads to work stoppages or slowdowns.

Overall site/job organization is relatively informal even for a residential contractor.

3.5 Quality

As always quality is dificult to define. Since the houses are all fairly simple in design, and the volunteers are enthusiastic to do a good job, the quality would probably be considered good overall. One way to compare quality is to note how the Habitat for Humanity homes fared during Hurricane Andrew. According to the local chapter director the Habitat for Humanity homes that were built in south Florida seemed to do better on average than comparable homes.

Since most of the labor is free there also seems to be less resistance to re-working something that is found to be wrong. However, this "free" labor contributes to some of the quality problems because the experience level of the volunteers is so varied. Being a volunteer provided a unique perspective to observe first hand how the quality level was directly proportional to the amount of time the superintendent has to monitor the foremen. When things were fairly slow the superintendents could anticipate problems and correct them before the work was done. Again since the experience levels of the volunteers is low the superintendent has to have even more time to explain what needs to be done than in the case of a private (for profit) superintendent.

3.6 Average Home Costs

The cost of a average home was the last area that was studied. This is one area where the differences between a private builder, who builds for profit, and Habitat for Humanity are significant. Donations of material, tools, land, and money are all critical in keeping the cash flow positive and allowing Habitat to continue building. Since private builders operate so differently this area was not studied in depth. The latest cost breakdown is included as Table 3-2 for information.

Table 3-2, Estimated House Costs for an Average Alachua Habitat for Humanity House in 1993

Site Preparation (Survey, Utilities Hook-up, Permits, etc.)	$2,800
Foundation (Fill, Footings, Block Stemwall, Slab)	$2,700
Framing and Exterior Walls (Lumber, Siding, Windows, etc.)	$4,700
Roofing (Trusses, Decking, Shingles, Fascia, etc.)	$3,500
Interior (Insulation, Sheet Rock, Plaster, Appliances, etc.)	$8,000
Electrical (Light fixtures, wire, boxes, etc.)	$2,000
Heating (Ductwork, furnace, etc.)	$1,400
Plumbing (Water heater, bath and kitchen fixtures, etc.)	$1,700
Driveway & Landscaping	$1,000
Closing and Office Costs	$5,000
Total	$32,800

The above total does not include the cost of land which is normally minimal. Using a house size of about 1,050 sf results in a square footage cost of approximately $32. This low square footage cost, and the ability to offer no

interest long term loans with very little cash down, is what makes the financial end of the program affordable to the working poor.

CHAPTER 4
RECOMMENDED SOLUTIONS

4.1 Productivity

The previous chapter showed that all the productivity sampling techniques that were tried out in the field verified fairly low production rates. Some of the constraints that contribute to this are:

(1.) no written schedule,

(2.) the unknown number of unskilled volunteer labor that shows up each work day,

(3.) site/job organization, and,

(4.) quality.

Recommended solutions to mitigate the impact of each of these problems will be discussed in this chapter. The proposed solutions were driven by their need to be fairly simple and inexpensive. The idea was to suggest things that would be straight forward to implement and which would have a high probability of continuation.

4.2 Scheduling

This is probably the area where the biggest changes can be made. Habitat can not realistically met any of their future production goals without using written schedules as a method of tracking the "cycle time" it takes to build a house. There are a lot of reasons why they have not been able to build the number of units that they want at any one time and they have all been brought up at the

construction committee meetings. However, because nobody has taken the time to set a written schedule and track milestones there has never been any major changes in procedures to improve production.

The coordination of material is another area where a written schedule would be a real benefit. The verbal system in place works but again it would be hard to improve it to the degree where significant improvements in production could be seen. An attempt to set up a generic schedule was tried using two scheduling techniques;

(1) Precedence Method, and

(2) Bar Chart (Gantt) Method.

Since both of these methods are so common a discussion of each was not included (Excellent descriptions of both methods are given starting on page 143 and page 55, respectfully, of reference 3).

4.2.1 Precedence Method using Primavera Project Planner (P^3)

The P^3 software system was initially chosen because it is so comprehensive. It would allow Habitat to track the construction, major material items, and even costs associated with each house. While profit is not an issue for Habitat they are required to track how much each house costs so that the new homeowner can be charged appropriately. A listing of the activities was the first step since nobody had developed a schedule before. There had been an attempt a few years earlier to at least write down the major steps of the process so a copy of this list became the starting point. The activities were numbered and a rough schedule manually drawn to get an idea of all the proper relationships. This rough schedule was then discussed with the senior field superintendent to ensure that the logic was correct. After minor changes the rough schedule was inputted into the computer on P^3 and the first draft of the generic schedule

developed. The activity list schedule with predecessors and successors, the bar chart, and the precedence diagram were printed and then taken back to the next construction committee meeting for review (See Appendixes C, D, and E). The precedence diagram was laid out and everyone given a copy of the activity list schedule so that any problems and questions could be discussed. It became quickly apparent that the P^3 program was just too much for the committee. About half of the members did not feel that they would ever be able to follow the precedence diagram. The bar chart received about the same reception, mostly because there was just too much information on the sheet. Everyone did agree that they would rather use a bar chart rather than a precedence diagram.

The cost of the software and the amount of time it would take to come up to speed was then brought up and debated. The bottom line was that the P^3 system was just too big a leapt and would not work for them, at least at this point. The committee felt that they had enough computer literate volunteers that they could handle a computer scheduling system and asked if there was a system that was simpler, cheaper, and still sophisticated enough to let them grow.

The computer scheduling programs CPM18, MacProject, and Suretrak were evaluated to determine if they would fit the organizational needs better. CPM18 was a bit too limited and MacProject requires an Apple Computer (Habitat only has one Apple computer) so they were both eliminated. This left Suretrak as the only possibility.

4.2.2 Bar Chart Method using Suretrak

The idea that there was just too much information on the first schedule set the tone for the next iteration. The activity list was reviewed with an eye to consolidate or eliminate as many activities as possible. This resulted in the list going from over 80 activities to less than 45. The duration's were also modified

to better reflect the performance out in the field. The intent was for this schedule to set the benchmark for future production improvements. The new list of activities is attached as Appendix F and the revised bar chart schedule as Appendix G. All the above changes have made the schedule much less intimidating and, hopefully, more usable.

Material resources have not been added to the schedule at this time. There needs to be some time for the superintendents to get used to the idea of using a simple bar chart before anything else is added.

4.3 Volunteer Labor Force

The nature of Habitat for Humanity precludes the elimination of the volunteer work force in exchange for an increase in production. The challenge is to see what can be done within this constraint. One answer seems be to be the use of the schedule to improve the flexibility of the superintendents.

By doing some careful advanced planning the superintendents and the main office can put together a strategy to be ready to work on more activities each week than they feel will actually get done. The superintendents will then know what is possible to do (even if it is off the critical path) and that they have material to do the work. If a large number of volunteers shows up all the activities may get done, if only a few then the rest of the activities are already planned and will be done the next work day. This will take commitment and hard work on the supervisor level but it would benefit the volunteers in the field. Once everyone has become comfortable with this they should be able to take into consideration the seasonal fluxes like semester changes, and football games, which affect the number of people who volunteer.

The schedule should also be posted in a conspicuous place where everyone can see it. Once the volunteer shows up he should be taken by the volunteer

coordinator (or superintendent) and shown on the schedule where the project currently is and briefed on the goals for the day. The skill level of the volunteer can then be determined and a work assignment made as appropriate. Briefing the volunteers gives them a better idea of what is going on and should make them feel more comfortable that they know a little bit about the projects' status. Even a residential project can be intimidating if you have never been on a construction site in your life. In addition, some of the volunteers have a lot of experience and this brief would allow them to quickly come up to speed so that their skills can be better put to work.

The construction committee has talked about the need to provide basic training to all the volunteers before they start work. They would go over things like nail types, common tools, site safety, and general construction terms. This seems like a good idea if it can implemented.

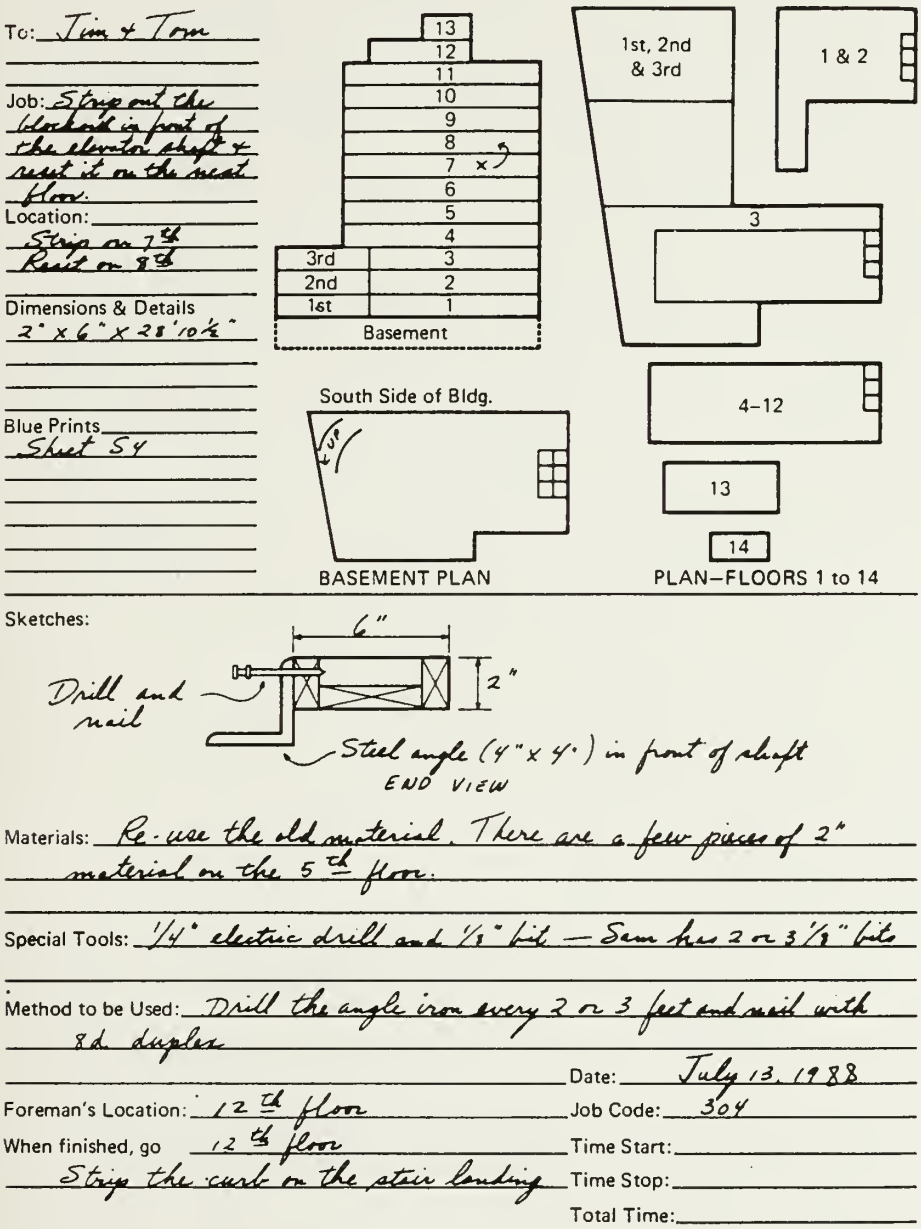
4.4 Site/Job Organization

The two problems mentioned in the previous chapter concerning the superintendents time, and communication, are both tied into the schedule. If the superintendent has pre-planned the work he wants done and used the schedule as a tool then he should be able to spend more time checking his foremen and anticipating problems. The schedule is a communication facilitator that would allow him to be more flexible on the work days.

In addition to the schedule, the superintendent could get more done each work day if he not only planned the activities he wanted done but also filled out job assignment sheets. These sheets give written rather than oral direction and are normally used on large complex projects. They would also be a good idea for Habitat because even though building a house is not all that complex for a professional building crew it is for a group of volunteers. Figure 4-1 shows an

example of a job assignment sheet that could be modified. The superintendent would fill these out for each of the activities he has scheduled. Once an activity sheet is given to a volunteer foreman that person could better visualize exactly what the superintendent wanted.

Figure 4-1, Foreman's Job Assignment Sheet (2, pg. 128)



4.5 Quality

Even though the quality of the homes is considered good, there could be improvements. This is especially true in the area of rework. If all the above ideas are implemented this area would be one of the biggest benefactors. Rework will never go away completely but it can be minimized.

CHAPTER 5
CONCLUSION

This report has given me the opportunity to tie many of the techniques and methods that are learned in the classroom to their practical applications in the field. It is interesting to see that many of the problems in the construction business are typical no matter what type of project you are working on. Many people might feel that their project is just too small to justify the application of formal construction management techniques. The success of any project, however, is heavily dependent on the amount of pre-planning that is invested prior to doing any work in the field. Construction management techniques are just formalized ways to plan what is going to happen so that the effort at the work face is not wasted and can be applied to any size project with success.

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APPENDIX A
PRODUCTIVITY SURVEY FORMS

ADJUSTED FIELD RATING INDEX

Time Start: Time End: Location: Superintendent: Weather:		Time Start: Time End: Location: Superintendent: Weather:	
Productive Workers	Non-productive Workers	Productive Workers	Non-productive Workers
# of workers on job: # of workers observed: # of workers working: % of workers working: Add 10% personal time **Adj. Field Rating Index:**		# of workers on job: # of workers observed: # of workers working: % of workers working: Add 10% personal time **Adj. Field Rating Index:**	

Morning Sample

Afternoon Sample

LABOR-UTILIZATON FACTOR

Time Start: Time End: Location: Superintendent: Weather:			Time Start: Time End: Location: Superintendent: Weather:		
Effective Workers	Contributory Workers	Ineffective Workers	Effective Workers	Contributory Workers	Ineffective Workers
#workers on job: #workers observed: #workers effective: 1/4 of Contrib. Workers: Labor Utilization Factor:			#workers on job: #workers observed: #workers effective: 1/4 of Contrib. Workers: Labor Utilization Factor:		

Morning Sample

Afternoon Sample

FIVE MINUTE RATING

Date:
Location:
Superintendent:
Weather:

Time	1	2	3	4	5	6	7	8	Comments
Start									

Total man units _____ Effective _____ Effectiveness _____ %

APPENDIX B
CRITERIA FOR HABITAT HOMES

B.1 General

Houses shall typically have three or four bedrooms. Five bedroom houses will be built only under very special circumstances and require special approval by the Board of Directors. Two bedroom houses will also be constructed only if available lot size dictates a small size or if a small family is selected and it appears highly probable that the house will remain useful to the family for a reasonable number of years. It is recognized that the market for two bedroom houses is much smaller than that for three and four bedroom units.

Each house shall have bedrooms, a living space, kitchen/dining area, and one bathroom. The bathroom may be divided with a door between the toilet/bath/shower area and a vanity/sink area.

A wooden storage shed will be built on site.

Neither garages or carports are provided.

Size of house shall not exceed the following limits unless special circumstances warrant increases and an increase in size is approved by the Board of Directors.

Two Bedroom - 900 square feet

Three Bedroom - 1050 square feet

Four Bedroom - 1150 square feet

B.2 Type of Construction

The following is a listing of the types of construction and components which will be used:

- Concrete slab on grade or stem wall
- Wood frame (2X4 framing)
- Gable or hip roof

B.2.1 Roof

Hip roof provide more overhang and thus greater shading of the walls and windows improving energy performance. The hip roof is considered by some to be more esthetically pleasing. The hip roof requires a more complex truss system. An alternative that gives the advantages of overhang is a Boston Hip roof (modified hip roof). The Boston Hip roof also allows for installation of vents in the gable ends. Hip roof cost ten to twenty percent more than gable roofs. Modified hip roof trusses cost more than gable trusses, but less than a set of full hip trusses.

Roof pitch shall be 4/12.

Shingles on roofs shall be fiberglass reinforced and fungus resistant. Color choice shall be selected by the owner.

Continuous ridge venting shall be provided even if gable vents are used. Soffit vents shall be continuous under the eaves.

B.2.2 Insulation

Walls shall be insulated to an R-11 value using Kraft backed fiberglass insulation. Ceilings shall be insulated to an R-30 value using blown-in insulation or batt insulation.

B.2.3 Windows

Size, placement, and type of window is very important to minimize heat gain

and maximize ventilation. Windows should be selected to provide good ventilation. Security should be a consideration, especially for windows on the rear of the house. Windows on the east and west side of the house will tend to be smaller with larger windows placed on the north and south sides of the house. The purpose of this placement is to avoid direct solar radiation from the east and west. If east/west windows are protected by porch overhangs of approximately six feet, larger windows are permitted.

B.2.4 Doors

Exterior doors shall be steel clad. A single cylinder dead bolt and entry lock shall be provided on the front and back door. Lock hardware shall be standard duty. All locks shall be keyed alike so one key can operate all locks. A screen door shall be provided on the front and back entrances.

Interior doors shall be pre-hung hollow core doors. Standard bedroom and bathroom hardware shall be provided. The bathroom/bedroom doors shall be at least 2'8" or greater for increased accessibility.

B.2.5 Heating, Ventilating, and Air Conditioning

All homes shall be provided with ducted heating systems. Air conditioning shall not be provided because of the high utility cost associated with air conditioning may be out of reach for the prospective homeowners. Efforts shall be made on each house design to provide energy efficiency with a comfortable house environment. In Alachua County, cooling is more of a human comfort problem than heating. Since the houses are not air conditioned, special efforts shall be made to prevent heat gain and to provide ventilation.

Each house shall be site specific. That is, orientation of the house, window placement, shading, etc., shall be considered to prevent heat gain in the summer and to provide natural ventilation . Other features to prevent heat gain are roof

overhang over the windows and well vented attic spaces. Ceiling fans shall be installed in the bedrooms and the living room.

B.2.6 Water Heating

The water heater shall be gas fired; thirty gallons for a family of four or less and forty gallons for a larger family.

B.2.7 Kitchen

The kitchen shall contain a refrigerator/freezer of 16 cubic feet for a family of four or less and 18 cubic feet for a family of five or more. A 30 inch gas stove/oven and externally vented hood will be installed. Appliances shall be white or almond.

Base cabinets and wall cabinets shall be installed to provide the maximum storage allowed within the kitchen area. Counter top shall be Formica. The kitchen sink shall be a double stainless steel sink. A fire extinguisher shall be installed in the kitchen.

B.2.8 Bathroom

One bathroom shall be built in each home. A door shall close off the bathroom from the hallway or house. The bathroom area shall include a standard commode and tub/shower with a shower rod. An externally vented fan shall be provided. The shower shall include a soap dish and towel bar. Also included in the bathroom are a 3' vanity cabinet, a sink, 2' x3' wall mirror and medicine cabinet, and a 2' x3' opaque window. Wall fixtures shall be provided including toothbrush holder, a soap dish, and towel bar. The wall of the tub/shower area shall be tiled to a height of 6 feet.

B.2.9 Washer/Dryer Space

An area shall be provided for installation of a clothes washer and dryer. Water supply and drain plumbing shall be provided for the washer. Appropriate

electrical outlets shall be provided for both appliances. A gas supply shall be provided for the dryer. The dryer shall be vented to the outside preferably by a horizontal duct.

A shelf or other suitable storage means shall be provided for washer/dryer supplies.

B.2.10 Interior Walls

Wall surfaces inside the house shall be unical hardcoat, painted with semi-gloss latex paint. The color shall be chosen by the homeowner. Ceilings shall be hardcoat.

B.2.11 Exterior Walls

Wall covering on the exterior will be plywood siding; T-111; or RB&B. Soffits and facia boards may be wood or aluminum. Paint color will be chosen by the Homeowner.

B.2.12 Window Coverings

Mini blinds will be installed at all standard size windows.

B.2.13 Flooring

Vinyl flooring shall be provided throughout the house. The flooring will be commercial grade 1/8" thick.

B.2.14 Vehicle Parking and Walkway

A concrete driveway according to code requirements shall be provided. A concrete walkway shall lead from the driveway to the front entrance door.

B.2.15 Entrance

If the house design does not include a covered porch, concrete stoops shall be provided at all exterior doors. The front concrete stoop shall be at least twenty five square feet. The front entrance stoop shall be covered.

B.2.16 Fences

Fences are normally excluded from the provisions of a Habitat for Humanity home. An exception to this exclusion arises when a fence is needed for safety (e.g. from a drainage ditch, railroad track, or other hazard). Fences can only be installed when specifically approved by the board.

B.2.17 Electrical Supply and Wiring

An electrical supply panel with 200A capacity shall be provided. An outside outlet shall be provided front and back.

Wiring shall be provided for a television antenna jack in the living room and the master bedroom.

A doorbell chime shall be optional.

B.2.17 Closets

Bedroom clothes closets shall be a minimum of six feet wide in the master bedroom and four feet wide in other bedrooms. Closets shall have louvered bi-fold doors for ventilation.

B.2.18 Lighting

Ceiling light kits for fans shall be provided in the bedrooms. A fluorescent light fixture shall be provided in the kitchen and bathroom. The porches and entrance area shall have light fixtures. Security lighting shall be near the driveway.

B.2.19 Attic

The scuttle opening shall be 2 X 3 feet. A light with pull chain shall be provided.

B.2.20 Landscaping

Shrubs and plants shall be provided at the front of the house. Trees shall be planted if required by the municipal code authority. Landscaping (grassing) shall be done as appropriate.

Wooded lots shall be cleared only to the extent necessary for the house, driveway, and septic tank. Care shall be taken to leave the maximum number of trees and other native vegetation. A goal is to leave as much of the lot as possible in natural vegetation.

B.3 Exclusions

Certain features and amenities must be excluded from Alachua Habitat for Humanity homes. These exclusions do not detract from the basic livability of the houses. They are made in order to share the limited monetary resources with the next Habitat family (i.e. to provide as much basic housing as possible). Excluded features include:

- Air conditioning
- Freezer
- Dishwasher
- Washer
- Dryer
- Picture Windows
- Paneling
- Window Shutters
- Rain Gutters
- Fences
- Garages
- Carports

B.4 Exception to Criteria

Criteria set down in this document are intended to define the basic Alachua Habitat for Humanity house. Exceptions will be allowed for the following reasons:

(a) Material or equipment of equal or higher quality are donated and have no financial impact on Alachua Habitat for Humanity and the prospective owner.

(b) Safety or municipal codes require changes.

(c) The selected family has special needs related to health or well being.

(d) Other reasons as approved by the Board of Directors.

B.5 Modification to Criteria

The criteria shall be reviewed by the construction committee at periodic intervals not to exceed one year. Changes shall be recommended to the Board of Directors.

	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
0	4	4	0		SITE APPROVAL - BOARD	30OCT93	3NOV93	30OCT93	3NOV93	0
0	1	1	0		BOUNDARY SURVEY	4NOV93	4NOV93	4NOV93	4NOV93	0
0	8	8	0		CLOSE ON SITE	5NOV93	13NOV93	5NOV93	13NOV93	0
0	2	2	0		SITE PLAN APPROVAL	15NOV93	16NOV93	15NOV93	16NOV93	0
0	4	4	0		BUILDING PERMIT APPROVAL	17NOV93	20NOV93	17NOV93	20NOV93	0
0	1	1	0		SEPTIC TANK PERMIT OR SEWER LOCATE	17NOV93	17NOV93	7JAN94	7JAN94	41
0	1	1	0		PORTA POTTY ORDERED	17NOV93	17NOV93	25JAN94	25JAN94	56
0	4	4	0		ORDER SEPTIC TANK	18NOV93	22NOV93	8JAN94	12JAN94	41
0	4	4	0		SITE CLEAN UP	22NOV93	25NOV93	22NOV93	25NOV93	0
0	4	4	0		PLUMBING PERMIT PULLED	22NOV93	25NOV93	27NOV93	1DEC93	5
0	4	4	0		APPLY FOR TEMPORARY ELECTRIC	22NOV93	25NOV93	6DEC93	9DEC93	12
0	4	4	0		HVAC PERMIT PULLED	22NOV93	25NOV93	13JAN94	17JAN94	42
0	4	4	0		ELECTRIC PERMIT PULLED	22NOV93	25NOV93	13JAN94	17JAN94	42
0	2	2	0		INSTALL SEPTIC TANK (IF NEEDED)	25NOV93	26NOV93	15JAN94	17JAN94	41
0	1	1	0		LAYOUT AND STAKE	26NOV93	26NOV93	26NOV93	26NOV93	0
0	1	1	0		TEMPORARY POLE SET UP	26NOV93	26NOV93	10DEC93	10DEC93	12
0	2	2	0		DIG FOOTERS	27NOV93	29NOV93	27NOV93	29NOV93	0
0	2	2	0		TEMPORARY ELECTRIC HOOKED UP	27NOV93	29NOV93	11DEC93	13DEC93	12
0	1	1	0		INSTALL REBAR	30NOV93	30NOV93	30NOV93	30NOV93	0
1	1	1	0		POUR FOOTER	1DEC93	1DEC93	1DEC93	1DEC93	0
1	1	1	0		CALL PLUMBER	2DEC93	2DEC93	2DEC93	2DEC93	0
	1	1	0		STEM WALLS - BLOCK	2DEC93	2DEC93	6DEC93	6DEC93	3

Y	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
40	1	1	0		BACKFILL AND GRADE FOR SLAB	3DEC93	3DEC93	7DEC93	7DEC93	3
50	1	1	0		PLUMBING - ROUGH - IN	8DEC93	8DEC93	8DEC93	8DEC93	0
70	1	1	0		TERMITE INJECTION	9DEC93	9DEC93	9DEC93	9DEC93	0
60	6	6	0		ORDER TRUSSES AND WINDOWS	9DEC93	15DEC93	14DEC93	20DEC93	4
80	1	1	0		PLASTIC AND WIRE MESH	10DEC93	10DEC93	10DEC93	10DEC93	0
90	1	1	0		SLAB POURED	11DEC93	11DEC93	11DEC93	11DEC93	0
00	1	1	0		LAYOUT FLOOR PLAN	13DEC93	13DEC93	13DEC93	13DEC93	0
10	6	6	0		FRAME WALLS	14DEC93	20DEC93	14DEC93	20DEC93	0
40	4	4	0		ROOFING TRUSSES	21DEC93	27DEC93	21DEC93	27DEC93	0
30	1	1	0		ORDER LANDSCAPE MATERIAL	21DEC93	21DEC93	19JAN94	19JAN94	22
70	6	6	0		WOOD SIDING	23DEC93	31DEC93	23DEC93	31DEC93	0
50	1	1	0		SUB - FACIA	28DEC93	28DEC93	3JAN94	3JAN94	4
60	2	2	0		ROOFING	29DEC93	30DEC93	4JAN94	5JAN94	4
80	2	2	0		WINDOW INSTALLING	3JAN94	4JAN94	3JAN94	4JAN94	0
90	1	1	0		EXTERIOR DOOR INSTALLATION	3JAN94	3JAN94	4JAN94	4JAN94	1
10	1	1	0		WALL INSULATION	5JAN94	5JAN94	6JAN94	6JAN94	1
30	1	1	0		PLUMBING - INTERMEDIATE	5JAN94	5JAN94	17JAN94	17JAN94	10
90	1	1	0		HVAC - ROUGH - IN	5JAN94	5JAN94	18JAN94	18JAN94	11
00	1	1	0		ELECTRICAL AND PHONE - ROUGH - IN	5JAN94	5JAN94	18JAN94	18JAN94	11
30	2	2	0		MARBLE SILL INSTALATION	5JAN94	6JAN94	19JAN94	20JAN94	12
91	2	2	0		TRIM	6JAN94	7JAN94	6JAN94	7JAN94	0
20	3	3	0		DRYWALL HANGING WALLS AND CEILINGS	6JAN94	8JAN94	7JAN94	10JAN94	1

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
400	2	2	0		EXTERIOR PAINT AND STAIN - PRIMER	8JAN94	10JAN94	8JAN94	10JAN94	0
540	1	1	0		FINISH DRYWALL AND CEILINGS	10JAN94	10JAN94	11JAN94	11JAN94	1
430	2	2	0		FINISH GRADING	11JAN94	12JAN94	11JAN94	12JAN94	0
560	1	1	0		INTERIOR DOOR PREP	11JAN94	11JAN94	12JAN94	12JAN94	1
550	1	1	0		MEASURE FOR CABINETS AND ORDER	11JAN94	11JAN94	18JAN94	18JAN94	6
590	1	1	0		ORDER VENETIAN BLINDS AND APPLIANCES	11JAN94	11JAN94	18JAN94	18JAN94	6
730	2	2	0		EXTERIOR PAINT AND STAIN - FINAL	11JAN94	12JAN94	18JAN94	19JAN94	6
600	1	1	0		CERAMIC TILE	11JAN94	11JAN94	19JAN94	19JAN94	7
620	1	1	0		ATTIC INSULATION	11JAN94	11JAN94	19JAN94	19JAN94	7
570	1	1	0		INTERIOR DOOR INSTALLING	12JAN94	12JAN94	13JAN94	13JAN94	1
690	1	1	0		VENETIAN BLINDS INSTALLING	12JAN94	12JAN94	20JAN94	20JAN94	7
700	1	1	0		GROUT CERAMIC TILE	12JAN94	12JAN94	20JAN94	20JAN94	7
440	1	1	0		SET UP DRIVES AND WALKS	13JAN94	13JAN94	13JAN94	13JAN94	0
580	2	2	0		INTERIOR PAINTING	13JAN94	14JAN94	14JAN94	15JAN94	1
450	1	1	0		POUR DRIVES AND WALKS	14JAN94	14JAN94	14JAN94	14JAN94	0
470	2	2	0		FENCING (IF NEEDED)	14JAN94	15JAN94	19JAN94	20JAN94	4
610	2	2	0		VINYL FLOOR INSTALLING	15JAN94	17JAN94	17JAN94	18JAN94	1
670	1	1	0		PLUMBING - FINISH	15JAN94	15JAN94	18JAN94	18JAN94	2
630	1	1	0		HVAC FINISH	15JAN94	15JAN94	19JAN94	19JAN94	3
640	1	1	0		CEILING FANS	15JAN94	15JAN94	19JAN94	19JAN94	3
650	1	1	0		ELECTRIC - FINISH	15JAN94	15JAN94	19JAN94	19JAN94	3
680	1	1	0		ENGINEERING INSPECTION	17JAN94	17JAN94	19JAN94	19JAN94	2

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
660	1	1	0		INSTALL CABINETS	18JAN94	18JAN94	19JAN94	19JAN94	1
710	1	1	0		BASE BOARDS	18JAN94	18JAN94	19JAN94	19JAN94	1
740	1	1	0		ENGINEERING INSECTION	18JAN94	18JAN94	20JAN94	20JAN94	2
720	1	1	0		TOUCH - UP PAINT AND CAULK	19JAN94	19JAN94	20JAN94	20JAN94	1
460	1	1	0		LANDSCAPE	20JAN94	20JAN94	20JAN94	20JAN94	0
750	1	1	0		PUNCH LIST	21JAN94	21JAN94	21JAN94	21JAN94	0
760	1	1	0		CLEAN - UP	22JAN94	22JAN94	22JAN94	22JAN94	0
770	1	1	0		APPLIANCES DELIVERED	24JAN94	24JAN94	24JAN94	24JAN94	0
780	1	1	0		REMOVE PORTA POTTY	24JAN94	24JAN94	26JAN94	26JAN94	2
790	1	1	0		FINAL INSPECTION FOR CO	25JAN94	25JAN94	25JAN94	25JAN94	0
800	1	1	0		REMOVE TEMPORARY POWER POLE	26JAN94	26JAN94	26JAN94	26JAN94	0
810	1	1	0		MOVE OUT	27JAN94	27JAN94	27JAN94	27JAN94	0

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
10	4	4	0		SITE APPROVAL - BOARD	30OCT93	3NOV93	30OCT93	3NOV93	0
10*	4	4	0	PR	SITE APPROVAL - BOARD	30OCT93	3NOV93	30OCT93	3NOV93	0
20	1	1	0		BOUNDARY SURVEY	4NOV93	4NOV93	4NOV93	4NOV93	0
10	4	4	0	PR	SITE APPROVAL - BOARD	30OCT93	3NOV93	30OCT93	3NOV93	0
20*	1	1	0	PR	BOUNDARY SURVEY	4NOV93	4NOV93	4NOV93	4NOV93	0
30	8	8	0		CLOSE ON SITE	5NOV93	13NOV93	5NOV93	13NOV93	0
30*	8	8	0	PR	CLOSE ON SITE	5NOV93	13NOV93	5NOV93	13NOV93	0
40	2	2	0		SITE PLAN APPROVAL	15NOV93	16NOV93	15NOV93	16NOV93	0
40*	2	2	0	PR	SITE PLAN APPROVAL	15NOV93	16NOV93	15NOV93	16NOV93	0
50	4	4	0		BUILDING PERMIT APPROVAL	17NOV93	20NOV93	17NOV93	20NOV93	0
40*	2	2	0	PR	SITE PLAN APPROVAL	15NOV93	16NOV93	15NOV93	16NOV93	0
70	1	1	0		SEPTIC TANK PERMIT OR SEWER LOCATE	17NOV93	17NOV93	7JAN94	7JAN94	41
40*	2	2	0	PR	SITE PLAN APPROVAL	15NOV93	16NOV93	15NOV93	16NOV93	0
60	1	1	0		PORTA POTTY ORDERED	17NOV93	17NOV93	25JAN94	25JAN94	56
70*	1	1	0	PR	SEPTIC TANK PERMIT OR SEWER LOCATE	17NOV93	17NOV93	7JAN94	7JAN94	41
110	4	4	0		ORDER SEPTIC TANK	18NOV93	22NOV93	8JAN94	12JAN94	41

VITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
40	2	2	0	PR	SITE PLAN APPROVAL	15NOV93	16NOV93	15NOV93	16NOV93	0
50*	4	4	0	PR	BUILDING PERMIT APPROVAL	17NOV93	20NOV93	17NOV93	20NOV93	0
150	4	4	0		SITE CLEAN UP	22NOV93	25NOV93	22NOV93	25NOV93	0
50*	4	4	0	PR	BUILDING PERMIT APPROVAL	17NOV93	20NOV93	17NOV93	20NOV93	0
90	4	4	0		PLUMBING PERMIT PULLED	22NOV93	25NOV93	27NOV93	1DEC93	5
50*	4	4	0	PR	BUILDING PERMIT APPROVAL	17NOV93	20NOV93	17NOV93	20NOV93	0
120	4	4	0		APPLY FOR TEMPORARY ELECTRIC	22NOV93	25NOV93	6DEC93	9DEC93	12
50*	4	4	0	PR	BUILDING PERMIT APPROVAL	17NOV93	20NOV93	17NOV93	20NOV93	0
80	4	4	0		HVAC PERMIT PULLED	22NOV93	25NOV93	13JAN94	17JAN94	42
50*	4	4	0	PR	BUILDING PERMIT APPROVAL	17NOV93	20NOV93	17NOV93	20NOV93	0
100	4	4	0		ELECTRIC PERMIT PULLED	22NOV93	25NOV93	13JAN94	17JAN94	42
70	1	1	0	PR	SEPTIC TANK PERMIT OR SEWER LOCATE	17NOV93	17NOV93	7JAN94	7JAN94	41
110*	4	4	0	PR FS 2	ORDER SEPTIC TANK	18NOV93	22NOV93	8JAN94	12JAN94	41
200	2	2	0		INSTALL SEPTIC TANK (IF NEEDED)	25NOV93	26NOV93	15JAN94	17JAN94	41
150*	4	4	0	PR	SITE CLEAN UP	22NOV93	25NOV93	22NOV93	25NOV93	0
160	1	1	0		LAYOUT AND STAKE	26NOV93	26NOV93	26NOV93	26NOV93	0

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
120*	4	4	0	PR	APPLY FOR TEMPORARY ELECTRIC	22NOV93	25NOV93	6DEC93	9DEC93	12
130	1	1	0		TEMPORARY POLE SET UP	26NOV93	26NOV93	10DEC93	10DEC93	12
160*	1	1	0	PR	LAYOUT AND STAKE	26NOV93	26NOV93	26NOV93	26NOV93	0
170	2	2	0		DIG FOOTERS	27NOV93	29NOV93	27NOV93	29NOV93	0
130*	1	1	0	PR	TEMPORARY POLE SET UP	26NOV93	26NOV93	10DEC93	10DEC93	12
140	2	2	0		TEMPORARY ELECTRIC HOOKED UP	27NOV93	29NOV93	11DEC93	13DEC93	12
170*	2	2	0	PR	DIG FOOTERS	27NOV93	29NOV93	27NOV93	29NOV93	0
180	1	1	0		INSTALL REBAR	30NOV93	30NOV93	30NOV93	30NOV93	0
180*	1	1	0	PR	INSTALL REBAR	30NOV93	30NOV93	30NOV93	30NOV93	0
190	1	1	0		POUR FOOTER	1DEC93	1DEC93	1DEC93	1DEC93	0
90	4	4	0	PR	PLUMBING PERMIT PULLED	22NOV93	25NOV93	27NOV93	1DEC93	5
190*	1	1	0	PR	POUR FOOTER	1DEC93	1DEC93	1DEC93	1DEC93	0
220	1	1	0		CALL PLUMBER	2DEC93	2DEC93	2DEC93	2DEC93	0
190*	1	1	0	PR	POUR FOOTER	1DEC93	1DEC93	1DEC93	1DEC93	0
230	1	1	0		STEM WALLS - BLOCK	2DEC93	2DEC93	6DEC93	6DEC93	3
230*	1	1	0	PR	STEM WALLS - BLOCK	2DEC93	2DEC93	6DEC93	6DEC93	3

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
240	1	1	0		BACKFILL AND GRADE FOR SLAB	3DEC93	3DEC93	7DEC93	7DEC93	3
220*	1	1	0	PR FS 4	CALL PLUMBER	2DEC93	2DEC93	2DEC93	2DEC93	0
240	1	1	0	PR	BACKFILL AND GRADE FOR SLAB	3DEC93	3DEC93	7DEC93	7DEC93	3
250	1	1	0		PLUMBING - ROUGH - IN	8DEC93	8DEC93	8DEC93	8DEC93	0
250*	1	1	0	PR	PLUMBING - ROUGH - IN	8DEC93	8DEC93	8DEC93	8DEC93	0
270	1	1	0		TERMITE INJECTION	9DEC93	9DEC93	9DEC93	9DEC93	0
250*	1	1	0	PR	PLUMBING - ROUGH - IN	8DEC93	8DEC93	8DEC93	8DEC93	0
260	6	6	0		ORDER TRUSSES AND WINDOWS	9DEC93	15DEC93	14DEC93	20DEC93	4
250	1	1	0	PR	PLUMBING - ROUGH - IN	8DEC93	8DEC93	8DEC93	8DEC93	0
270*	1	1	0	PR	TERMITE INJECTION	9DEC93	9DEC93	9DEC93	9DEC93	0
280	1	1	0		PLASTIC AND WIRE MESH	10DEC93	10DEC93	10DEC93	10DEC93	0
280*	1	1	0	PR	PLASTIC AND WIRE MESH	10DEC93	10DEC93	10DEC93	10DEC93	0
290	1	1	0		SLAB POURED	11DEC93	11DEC93	11DEC93	11DEC93	0
290*	1	1	0	PR	SLAB POURED	11DEC93	11DEC93	11DEC93	11DEC93	0
300	1	1	0		LAYOUT FLOOR PLAN	13DEC93	13DEC93	13DEC93	13DEC93	0
140	2	2	0	PR	TEMPORARY ELECTRIC HOOKED UP	27NOV93	29NOV93	11DEC93	13DEC93	12
300*	1	1	0	PR	LAYOUT FLOOR PLAN	13DEC93	13DEC93	13DEC93	13DEC93	0

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
310	6	6	0		FRAME WALLS	14DEC93	20DEC93	14DEC93	20DEC93	0
260	6	6	0	PR	ORDER TRUSSES AND WINDOWS	9DEC93	15DEC93	14DEC93	20DEC93	4
310*	6	6	0	PR	FRAME WALLS	14DEC93	20DEC93	14DEC93	20DEC93	0
340	4	4	0		ROOFING TRUSSES	21DEC93	27DEC93	21DEC93	27DEC93	0
310*	6	6	0	PR	FRAME WALLS	14DEC93	20DEC93	14DEC93	20DEC93	0
330	1	1	0		ORDER LANDSCAPE MATERIAL	21DEC93	21DEC93	19JAN94	19JAN94	22
310	6	6	0	PR	FRAME WALLS	14DEC93	20DEC93	14DEC93	20DEC93	0
340*	4	4	0	PR SS 2	ROOFING TRUSSES	21DEC93	27DEC93	21DEC93	27DEC93	0
370	6	6	0		WOOD SIDING	23DEC93	31DEC93	23DEC93	31DEC93	0
340*	4	4	0	PR	ROOFING TRUSSES	21DEC93	27DEC93	21DEC93	27DEC93	0
350	1	1	0		SUB - FACIA	28DEC93	28DEC93	3JAN94	3JAN94	4
350*	1	1	0	PR	SUB - FACIA	28DEC93	28DEC93	3JAN94	3JAN94	4
360	2	2	0		ROOFING	29DEC93	30DEC93	4JAN94	5JAN94	4
260	6	6	0	PR	ORDER TRUSSES AND WINDOWS	9DEC93	15DEC93	14DEC93	20DEC93	4
370*	6	6	0	PR	WOOD SIDING	23DEC93	31DEC93	23DEC93	31DEC93	0
380	2	2	0		WINDOW INSTALLING	3JAN94	4JAN94	3JAN94	4JAN94	0
370*	6	6	0	PR	WOOD SIDING	23DEC93	31DEC93	23DEC93	31DEC93	0

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
390	1	1	0		EXTERIOR DOOR INSTALLATION	3JAN94	3JAN94	4JAN94	4JAN94	1
360	2	2	0	PR	ROOFING	29DEC93	30DEC93	4JAN94	5JAN94	4
380*	2	2	0	PR	WINDOW INSTALLING	3JAN94	4JAN94	3JAN94	4JAN94	0
390	1	1	0	PR	EXTERIOR DOOR INSTALLATION	3JAN94	3JAN94	4JAN94	4JAN94	1
510	1	1	0		WALL INSULATION	5JAN94	5JAN94	6JAN94	6JAN94	1
360	2	2	0	PR	ROOFING	29DEC93	30DEC93	4JAN94	5JAN94	4
380*	2	2	0	PR	WINDOW INSTALLING	3JAN94	4JAN94	3JAN94	4JAN94	0
390	1	1	0	PR	EXTERIOR DOOR INSTALLATION	3JAN94	3JAN94	4JAN94	4JAN94	1
480	1	1	0		PLUMBING - INTERMEDIATE	5JAN94	5JAN94	17JAN94	17JAN94	10
80	4	4	0	PR	HVAC PERMIT PULLED	22NOV93	25NOV93	13JAN94	17JAN94	42
250	1	1	0	PR	PLUMBING - ROUGH - IN	8DEC93	8DEC93	8DEC93	8DEC93	0
360	2	2	0	PR	ROOFING	29DEC93	30DEC93	4JAN94	5JAN94	4
380*	2	2	0	PR	WINDOW INSTALLING	3JAN94	4JAN94	3JAN94	4JAN94	0
390	1	1	0	PR	EXTERIOR DOOR INSTALLATION	3JAN94	3JAN94	4JAN94	4JAN94	1
490	1	1	0		HVAC - ROUGH - IN	5JAN94	5JAN94	18JAN94	18JAN94	11
100	4	4	0	PR	ELECTRIC PERMIT PULLED	22NOV93	25NOV93	13JAN94	17JAN94	42
360	2	2	0	PR	ROOFING	29DEC93	30DEC93	4JAN94	5JAN94	4
380*	2	2	0	PR	WINDOW INSTALLING	3JAN94	4JAN94	3JAN94	4JAN94	0
390	1	1	0	PR	EXTERIOR DOOR INSTALLATION	3JAN94	3JAN94	4JAN94	4JAN94	1
500	1	1	0		ELECTRICAL AND PHONE - ROUGH - IN	5JAN94	5JAN94	18JAN94	18JAN94	11
380*	2	2	0	PR	WINDOW INSTALLING	3JAN94	4JAN94	3JAN94	4JAN94	0
530	2	2	0		MARBLE SILL INSTALATION	5JAN94	6JAN94	19JAN94	20JAN94	12

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
380*	2	2	0	PR FS 1	WINDOW INSTALLING	3JAN94	4JAN94	3JAN94	4JAN94	0
390	1	1	0	PR FS 1	EXTERIOR DOOR INSTALLATION	3JAN94	3JAN94	4JAN94	4JAN94	1
391	2	2	0		TRIM	6JAN94	7JAN94	6JAN94	7JAN94	0
510*	1	1	0	PR	WALL INSULATION	5JAN94	5JAN94	6JAN94	6JAN94	1
520	3	3	0		DRYWALL HANGING WALLS AND CEILINGS	6JAN94	8JAN94	7JAN94	10JAN94	1
391*	2	2	0	PR	TRIM	6JAN94	7JAN94	6JAN94	7JAN94	0
400	2	2	0		EXTERIOR PAINT AND STAIN - PRIMER	8JAN94	10JAN94	8JAN94	10JAN94	0
520*	3	3	0	PR	DRYWALL HANGING WALLS AND CEILINGS	6JAN94	8JAN94	7JAN94	10JAN94	1
540	1	1	0		FINISH DRYWALL AND CEILINGS	10JAN94	10JAN94	11JAN94	11JAN94	1
400*	2	2	0	PR	EXTERIOR PAINT AND STAIN - PRIMER	8JAN94	10JAN94	8JAN94	10JAN94	0
430	2	2	0		FINISH GRADING	11JAN94	12JAN94	11JAN94	12JAN94	0
540*	1	1	0	PR	FINISH DRYWALL AND CEILINGS	10JAN94	10JAN94	11JAN94	11JAN94	1
560	1	1	0		INTERIOR DOOR PREP	11JAN94	11JAN94	12JAN94	12JAN94	1
540*	1	1	0	PR	FINISH DRYWALL AND CEILINGS	10JAN94	10JAN94	11JAN94	11JAN94	1
550	1	1	0		MEASURE FOR CABINETS AND ORDER	11JAN94	11JAN94	18JAN94	18JAN94	6
540*	1	1	0	PR	FINISH DRYWALL AND CEILINGS	10JAN94	10JAN94	11JAN94	11JAN94	1

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
590	1	1	0		ORDER VENETIAN BLINDS AND APPLIANCES	11JAN94	11JAN94	18JAN94	18JAN94	6
400*	2	2	0	PR	EXTERIOR PAINT AND STAIN - PRIMER	8JAN94	10JAN94	8JAN94	10JAN94	0
730	2	2	0		EXTERIOR PAINT AND STAIN - FINAL	11JAN94	12JAN94	18JAN94	19JAN94	6
540*	1	1	0	PR	FINISH DRYWALL AND CEILINGS	10JAN94	10JAN94	11JAN94	11JAN94	1
600	1	1	0		CERAMIC TILE	11JAN94	11JAN94	19JAN94	19JAN94	7
540*	1	1	0	PR	FINISH DRYWALL AND CEILINGS	10JAN94	10JAN94	11JAN94	11JAN94	1
620	1	1	0		ATTIC INSULATION	11JAN94	11JAN94	19JAN94	19JAN94	7
560*	1	1	0	PR	INTERIOR DOOR PREP	11JAN94	11JAN94	12JAN94	12JAN94	1
570	1	1	0		INTERIOR DOOR INSTALLING	12JAN94	12JAN94	13JAN94	13JAN94	1
590*	1	1	0	PR	ORDER VENETIAN BLINDS AND APPLIANCES	11JAN94	11JAN94	18JAN94	18JAN94	6
690	1	1	0		VENETIAN BLINDS INSTALLING	12JAN94	12JAN94	20JAN94	20JAN94	7
600*	1	1	0	PR	CERAMIC TILE	11JAN94	11JAN94	19JAN94	19JAN94	7
700	1	1	0		GROUT CERAMIC TILE	12JAN94	12JAN94	20JAN94	20JAN94	7
430*	2	2	0	PR	FINISH GRADING	11JAN94	12JAN94	11JAN94	12JAN94	0
440	1	1	0		SET UP DRIVES AND WALKS	13JAN94	13JAN94	13JAN94	13JAN94	0

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
540	1	1	0	PR	FINISH DRYWALL AND CEILINGS	10JAN94	10JAN94	11JAN94	11JAN94	1
570*	1	1	0	PR	INTERIOR DOOR INSTALLING	12JAN94	12JAN94	13JAN94	13JAN94	1
580	2	2	0		INTERIOR PAINTING	13JAN94	14JAN94	14JAN94	15JAN94	1
440*	1	1	0	PR	SET UP DRIVES AND WALKS	13JAN94	13JAN94	13JAN94	13JAN94	0
450	1	1	0		POUR DRIVES AND WALKS	14JAN94	14JAN94	14JAN94	14JAN94	0
440*	1	1	0	PR	SET UP DRIVES AND WALKS	13JAN94	13JAN94	13JAN94	13JAN94	0
470	2	2	0		FENCING (IF NEEDED)	14JAN94	15JAN94	19JAN94	20JAN94	4
580*	2	2	0	PR	INTERIOR PAINTING	13JAN94	14JAN94	14JAN94	15JAN94	1
610	2	2	0		VINYL FLOOR INSTALLING	15JAN94	17JAN94	17JAN94	18JAN94	1
200	2	2	0	PR	INSTALL SEPTIC TANK (IF NEEDED)	25NOV93	26NOV93	15JAN94	17JAN94	41
480	1	1	0	PR	PLUMBING - INTERMEDIATE	5JAN94	5JAN94	17JAN94	17JAN94	10
580*	2	2	0	PR	INTERIOR PAINTING	13JAN94	14JAN94	14JAN94	15JAN94	1
670	1	1	0		PLUMBING - FINISH	15JAN94	15JAN94	18JAN94	18JAN94	2
490	1	1	0	PR	HVAC - ROUGH - IN	5JAN94	5JAN94	18JAN94	18JAN94	11
580*	2	2	0	PR	INTERIOR PAINTING	13JAN94	14JAN94	14JAN94	15JAN94	1
630	1	1	0		HVAC FINISH	15JAN94	15JAN94	19JAN94	19JAN94	3
500	1	1	0	PR	ELECTRICAL AND PHONE - ROUGH - IN	5JAN94	5JAN94	18JAN94	18JAN94	11
580*	2	2	0	PR	INTERIOR PAINTING	13JAN94	14JAN94	14JAN94	15JAN94	1
640	1	1	0		CEILING FANS	15JAN94	15JAN94	19JAN94	19JAN94	3

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
500	1	1	0	PR	ELECTRICAL AND PHONE - ROUGH - IN	5JAN94	5JAN94	18JAN94	18JAN94	11
580*	2	2	0	PR	INTERIOR PAINTING	13JAN94	14JAN94	14JAN94	15JAN94	1
650	1	1	0		ELECTRIC - FINISH	15JAN94	15JAN94	19JAN94	19JAN94	3
670*	1	1	0	PR	PLUMBING - FINISH	15JAN94	15JAN94	18JAN94	18JAN94	2
680	1	1	0		ENGINEERING INSPECTION	17JAN94	17JAN94	19JAN94	19JAN94	2
550	1	1	0	PR	MEASURE FOR CABINETS AND ORDER	11JAN94	11JAN94	18JAN94	18JAN94	6
610*	2	2	0	PR	VINYL FLOOR INSTALLING	15JAN94	17JAN94	17JAN94	18JAN94	1
660	1	1	0		INSTALL CABINETS	18JAN94	18JAN94	19JAN94	19JAN94	1
610*	2	2	0	PR	VINYL FLOOR INSTALLING	15JAN94	17JAN94	17JAN94	18JAN94	1
710	1	1	0		BASE BOARDS	18JAN94	18JAN94	19JAN94	19JAN94	1
620	1	1	0	PR	ATTIC INSULATION	11JAN94	11JAN94	19JAN94	19JAN94	7
630	1	1	0	PR	HVAC FINISH	15JAN94	15JAN94	19JAN94	19JAN94	3
680*	1	1	0	PR	ENGINEERING INSPECTION	17JAN94	17JAN94	19JAN94	19JAN94	2
730	2	2	0	PR	EXTERIOR PAINT AND STAIN - FINAL	11JAN94	12JAN94	18JAN94	19JAN94	6
740	1	1	0		ENGINEERING INSECTION	18JAN94	18JAN94	20JAN94	20JAN94	2
580	2	2	0	PR	INTERIOR PAINTING	13JAN94	14JAN94	14JAN94	15JAN94	1
630	1	1	0	PR	HVAC FINISH	15JAN94	15JAN94	19JAN94	19JAN94	3
640	1	1	0	PR	CEILING FANS	15JAN94	15JAN94	19JAN94	19JAN94	3
650	1	1	0	PR	ELECTRIC - FINISH	15JAN94	15JAN94	19JAN94	19JAN94	3
660*	1	1	0	PR	INSTALL CABINETS	18JAN94	18JAN94	19JAN94	19JAN94	1
710*	1	1	0	PR	BASE BOARDS	18JAN94	18JAN94	19JAN94	19JAN94	1
720	1	1	0		TOUCH - UP PAINT AND CAULK	19JAN94	19JAN94	20JAN94	20JAN94	1

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
330	1	1	0	PR	ORDER LANDSCAPE MATERIAL	21DEC93	21DEC93	19JAN94	19JAN94	22
450*	1	1	0	PR FS 4	POUR DRIVES AND WALKS	14JAN94	14JAN94	14JAN94	14JAN94	0
460	1	1	0		LANDSCAPE	20JAN94	20JAN94	20JAN94	20JAN94	0
460*	1	1	0	PR	LANDSCAPE	20JAN94	20JAN94	20JAN94	20JAN94	0
470	2	2	0	PR	FENCING (IF NEEDED)	14JAN94	15JAN94	19JAN94	20JAN94	4
530	2	2	0	PR	MARBLE SILL INSTALATION	5JAN94	6JAN94	19JAN94	20JAN94	12
690	1	1	0	PR	VENETIAN BLINDS INSTALLING	12JAN94	12JAN94	20JAN94	20JAN94	7
700	1	1	0	PR	GROUT CERAMIC TILE	12JAN94	12JAN94	20JAN94	20JAN94	7
720	1	1	0	PR	TOUCH - UP PAINT AND CAULK	19JAN94	19JAN94	20JAN94	20JAN94	1
740	1	1	0	PR	ENGINEERING INSECTION	18JAN94	18JAN94	20JAN94	20JAN94	2
750	1	1	0		PUNCH LIST	21JAN94	21JAN94	21JAN94	21JAN94	0
750*	1	1	0	PR	PUNCH LIST	21JAN94	21JAN94	21JAN94	21JAN94	0
760	1	1	0		CLEAN - UP	22JAN94	22JAN94	22JAN94	22JAN94	0
590	1	1	0	PR FS 4	ORDER VENETIAN BLINDS AND APPLIANCES	11JAN94	11JAN94	18JAN94	18JAN94	6
760*	1	1	0	PR	CLEAN - UP	22JAN94	22JAN94	22JAN94	22JAN94	0
770	1	1	0		APPLIANCES DELIVERED	24JAN94	24JAN94	24JAN94	24JAN94	0
60	1	1	0	PR	PORTA POTTY ORDERED	17NOV93	17NOV93	25JAN94	25JAN94	56
760*	1	1	0	PR	CLEAN - UP	22JAN94	22JAN94	22JAN94	22JAN94	0
780	1	1	0		REMOVE PORTA POTTY	24JAN94	24JAN94	26JAN94	26JAN94	2
770*	1	1	0	PR	APPLIANCES DELIVERED	24JAN94	24JAN94	24JAN94	24JAN94	0
790	1	1	0		FINAL INSPECTION FOR CO	25JAN94	25JAN94	25JAN94	25JAN94	0

ITY	ORIG DUR	REM DUR	%	CODE	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	LATE START	LATE FINISH	TOTAL FLOAT
650	1	1	0	PR	ELECTRIC - FINISH	15JAN94	15JAN94	19JAN94	19JAN94	3
790*	1	1	0	PR	FINAL INSPECTION FOR CO	25JAN94	25JAN94	25JAN94	25JAN94	0
800	1	1	0		REMOVE TEMPORARY POWER POLE	26JAN94	26JAN94	26JAN94	26JAN94	0
780	1	1	0	PR	REMOVE PORTA POTTY	24JAN94	24JAN94	26JAN94	26JAN94	2
790	1	1	0	PR	FINAL INSPECTION FOR CO	25JAN94	25JAN94	25JAN94	25JAN94	0
800*	1	1	0	PR	REMOVE TEMPORARY POWER POLE	26JAN94	26JAN94	26JAN94	26JAN94	0
810	1	1	0		MOVE OUT	27JAN94	27JAN94	27JAN94	27JAN94	0

APPENDIX D
PRECEDENCE DIAGRAM SCHEDULE

10	1	0
SITE APPROVAL - ZONING		
2DEC'XO		2DEC'XO

20	1	0
SURVEY		
2DEC'XO		2DEC'XO

30	1	0
CLOSE ON SITE		
2DEC'XO		3JAN'XI

40	2	0
SITE PLAN APPROVAL		
17JAN'XI		14FEB'XI

50	1	0
BUILDING PERMIT APPROVAL		
17JAN'XI		3MAY'XI

100	1	42
ELECTRIC PERMIT PULLED		
2DEC'XO		2DEC'XO
1.5WEEK		17.5WEEK

110	1	0
SITE CLEAR UP		
2DEC'XO		2DEC'XO

120	1	5
PLUMBING PERMIT PULLED		
2DEC'XO		2DEC'XO
2WEEK		8WEEK

130	4	12
APPLY FOR TEMPORARY ELECTRIC		
2DEC'XO		2DEC'XO
0WEEK		12WEEK

86	4	42
HVAC PERMIT PULLED		
2DEC'XO		2DEC'XO
13WEEK		17WEEK

110	4	41
BORED SEPTIC TANK		
1DEC'XO		2DEC'XO
0WEEK		13WEEK

30	1	41
SEPTIC TANK PERMIT BY SOARS LIGHTS		
1DEC'XO		1DEC'XO
77JAN'XI		0TJAN'XI

300	2	11
INITIAL SEPTIC TANK FIT HEIGHT		
2DEC'XO		3JAN'XI
15JAN'XI		17JAN'XI

60	1	56
PORTA POTTI BROKEN		
1DEC'XO		1DEC'XO
2WEEK		2WEEK

150	1	0
SITE CLEAR UP		
2DEC'XO		2DEC'XO

160	1	0
LAYOUT AND STAKE		
2DEC'XO		2DEC'XO

170	2	0
RIG PROTOS		
2DEC'XO		2DEC'XO

180	1	0
FOOTINGS REBAR		
2DEC'XO		2DEC'XO

190	1	0
PIERS POUTER		
2DEC'XO		2DEC'XO

200	1	2
STEM WALLS - BLOCK		
2DEC'XO		4DEC'XO

200	1	0
SLAB PLUMBED		
2DEC'XO		4DEC'XO
2DEC'XO		4DEC'XO

240	1	3
BACKFILL AND REMOVE FORMS SLAB		
2DEC'XO		2DEC'XO

250	1	0
REMOVES - REMOVE - 14		
2DEC'XO		2DEC'XO

250	6	4
BACK DOORS AND WINDOWS		
2DEC'XO		2DEC'XO
1.4WEEK		2WEEK

270	1	0
TERMITE TREATMENT		
2DEC'XO		2DEC'XO
2DEC'XO		2DEC'XO

290	1	0
PLASTIC AND BOXE MESH		
1DEC'XO		1DEC'XO
1DEC'XO		1DEC'XO

300	1	0
LAYOUT FLOOR PLAN		
1DEC'XO		1DEC'XO
1DEC'XO		1DEC'XO

310	8	0
FRAME WALLS		
1DEC'XO		2DEC'XO
1.4WEEK		2DEC'XO

312	1	0
ROOFING TRUSSES		
2DEC'XO		2DEC'XO
2DEC'XO		2DEC'XO

270	4	0
WOOD SIDING		
2DEC'XO		11DEC'XO
2DEC'XO		11DEC'XO

340	2	0
WINDOW INSTALLING		
0DEC'XO		0DEC'XO
0DEC'XO		0DEC'XO

330	1	22
DOOR TRANSOMS MATERIAL		
31DEC'XO		31JAN'XI
1.5WEEK		1.5WEEK

350	1	4
SKIS - FASCIA		
2DEC'XO		2DEC'XO
1.5WEEK		2.5WEEK

360	2	4
ROOFING		
2DEC'XO		XDEC'XO
2WEEK		0WEEK

740	1	1
EXTERIOR DOOR INSTALLATION		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

500	1	11
ELECTRICAL AND PRIMER - ROUGH - IN		
0DEC'XO		0DEC'XO
1.5WEEK		1.5WEEK

500	2	12
MANUAL SCAN INSTALLATION		
0DEC'XO		0DEC'XO
1.5WEEK		2WEEK

510	1	1
WALL INSTALLATION		
0DEC'XO		0DEC'XO
2WEEK		0WEEK

520	2	1
DRYWALL HANGING WALLS AND CEILINGS		
0DEC'XO		0DEC'XO
0TJAN'XI		1.5WEEK

540	1	1
FINISH DRYWALL AND CEILINGS		
1DEC'XO		1DEC'XO
1.5WEEK		2WEEK

490	1	10
PLUMBING - INTERMEDIATE		
0DEC'XO		0DEC'XO
1.5WEEK		1.5WEEK

410	1	0
HVAC - ROUGH - IN		
0DEC'XO		0DEC'XO
1.5WEEK		1.5WEEK

394	2	0
TYVEK		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

400	2	0
EXTERIOR PRIME AND STAIN - PRIMER		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

420	2	0
FINISH GRADING		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

250	2	6
EXTERIOR PAINT AND STAIN - FINAL		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

390	1	0
SHOWER TUB SURROUNDS AND APPLIANCES		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

530	1	7
MINIMUM BLOCKS INSTALLING		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

550	1	0
MEASURE FOR CABINETS AND COUNTS		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

560	1	1
INTERIOR DOOR PREP		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

570	1	1
INTERIOR DOOR INSTALLING		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

600	1	7
CERAMIC TILE		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

700	1	2
GROUT CERAMIC TILE		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

440	1	0
SET UP DRIVES AND WALKS		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

470	2	1
FENCING (IF NEEDED)		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

450	1	0
REAR DRIVES AND WALKS		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

592	1	7
HVAC INSTALLATION		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

610	1	0
LANDSCAPE		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

850	1	3
ELECTRIC - FINISH		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

640	1	3
CEILING FANS		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

610	3	1
TOILET FLOOR INSTALLING		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

660	1	1
INSTALL CABINETS		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

730	1	1
TOUCH - UP PAINT AND CAULK		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

750	1	0
PUNCH LIST		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

760	1	0
CLEAN - UP		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

770	1	0
APPLIANCES DELIVERED		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

710	1	0
FINAL INSPECTION FOR CO		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

810	1	0
REMOVE TEMPORARY POWER POLE		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

814	1	0
MOVE OUT		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

530	1	1
HVAC FINISH		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

872	1	2
PLUMBING - FINISH		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

640	1	2
CARPENTRY INSPECTION		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

740	1	2
ENGINEERING INSPECTION		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

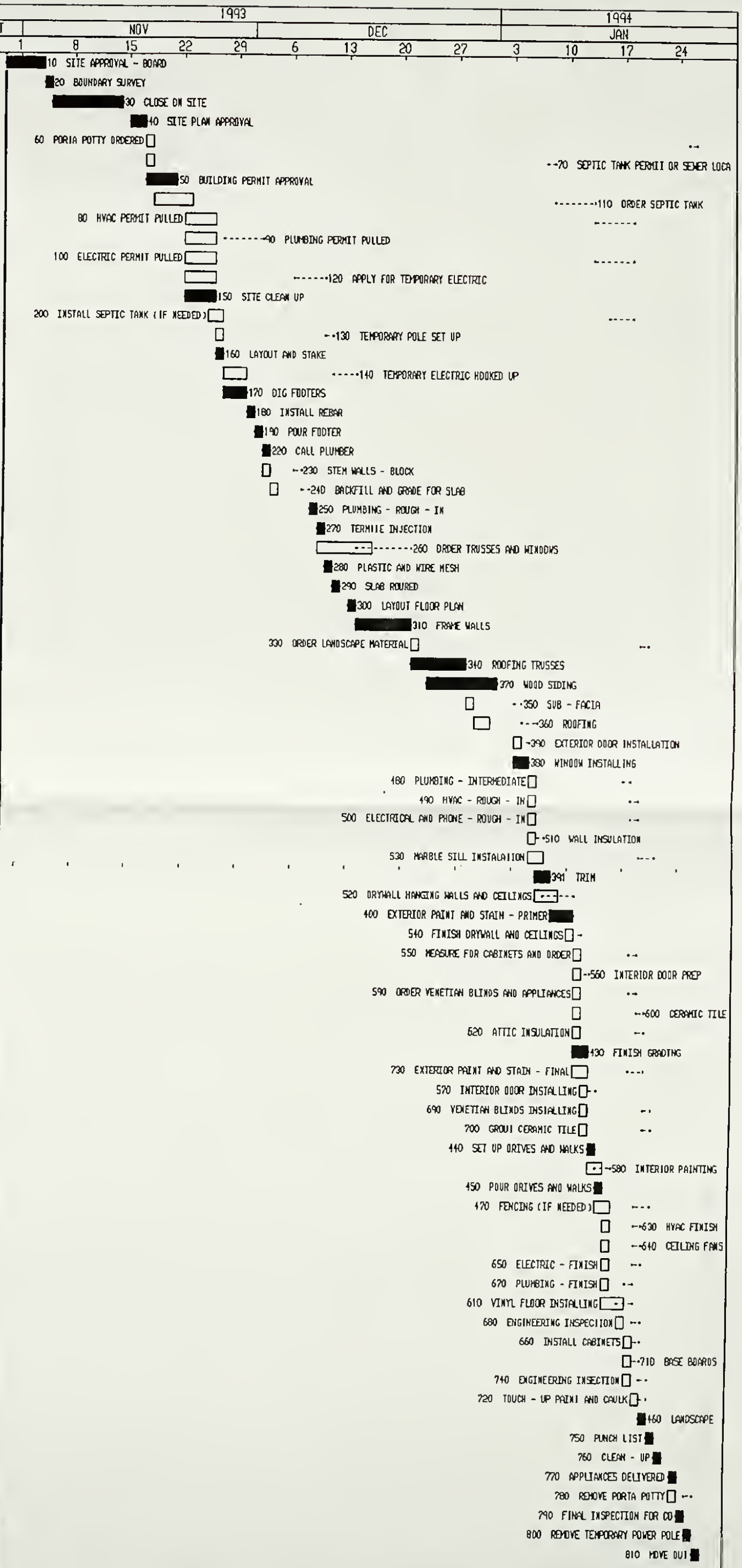
910	1	2
HOMES FINISH POINT		
0DEC'XO		0DEC'XO
0WEEK		0WEEK

Plot Date: 15AUG'XX
Data Date: 2DEC'XO
Project Start: 2DEC'XO
Project Finish: 27JAN'XI
(c) Primavera Systems, Inc

LEGEND
CRITICAL
ACTUAL WORK
REMAINING WORK
MILESTONE
SUMMARY

CPM
GENERIC SCHEDULE
HABITAT FOR HUMANITY

ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH
SITE APPROVAL - BOARD	30OCT93	3NOV93
BOUNDARY SURVEY	4NOV93	4NOV93
CLOSE ON SITE	5NOV93	13NOV93
SITE PLAN APPROVAL	15NOV93	16NOV93
PORTA POTTY ORDERED	17NOV93	17NOV93
SEPTIC TANK PERMIT OR SEWER LOCATE	17NOV93	17NOV93
BUILDING PERMIT APPROVAL	17NOV93	20NOV93
ORDER SEPTIC TANK	18NOV93	22NOV93
HVAC PERMIT PULLED	22NOV93	25NOV93
PLUMBING PERMIT PULLED	22NOV93	25NOV93
ELECTRIC PERMIT PULLED	22NOV93	25NOV93
APPLY FOR TEMPORARY ELECTRIC	22NOV93	25NOV93
SITE CLEAN UP	22NOV93	25NOV93
INSTALL SEPTIC TANK (IF NEEDED)	25NOV93	26NOV93
TEMPORARY POLE SET UP	26NOV93	26NOV93
LAYOUT AND STAKE	26NOV93	26NOV93
TEMPORARY ELECTRIC HOOKED UP	27NOV93	29NOV93
DIG FOOTERS	27NOV93	29NOV93
INSTALL REBAR	30NOV93	30NOV93
POUR FOOTER	1DEC93	1DEC93
CALL PLUMBER	2DEC93	2DEC93
STEM WALLS - BLOCK	2DEC93	2DEC93
BACKFILL AND GRADE FOR SLAB	3DEC93	3DEC93
PLUMBING - ROUGH - IN	6DEC93	6DEC93
TERMITE INJECTION	9DEC93	9DEC93
ORDER TRUSSES AND WINDOWS	9DEC93	15DEC93
PLASTIC AND WIRE MESH	10DEC93	10DEC93
SLAB POURED	11DEC93	11DEC93
LAYOUT FLOOR PLAN	13DEC93	13DEC93
FRAME WALLS	14DEC93	20DEC93
ORDER LANDSCAPE MATERIAL	21DEC93	21DEC93
ROOFING TRUSSES	21DEC93	27DEC93
WOOD SIDING	23DEC93	31DEC93
SUB - FACIA	28DEC93	28DEC93
ROOFING	29DEC93	30DEC93
EXTERIOR DOOR INSTALLATION	3JAN94	3JAN94
WINDOW INSTALLING	3JAN94	4JAN94
PLUMBING - INTERMEDIATE	5JAN94	5JAN94
HVAC - ROUGH - IN	5JAN94	5JAN94
ELECTRICAL AND PHONE - ROUGH - IN	5JAN94	5JAN94
WALL INSULATION	5JAN94	5JAN94
MARBLE SILL INSTALATION	5JAN94	6JAN94
TRIM	6JAN94	7JAN94
DRYWALL HANGING WALLS AND CEILINGS	6JAN94	8JAN94
EXTERIOR PAINT AND STAIN - PRIMER	8JAN94	10JAN94
FINISH DRYWALL AND CEILINGS	10JAN94	10JAN94
MEASURE FOR CABINETS AND ORDER	11JAN94	11JAN94
INTERIOR DOOR PREP	11JAN94	11JAN94
ORDER VENETIAN BLINDS AND APPLIANCES	11JAN94	11JAN94
CERAMIC TILE	11JAN94	11JAN94
ATTIC INSULATION	11JAN94	11JAN94
FINISH GRADING	11JAN94	12JAN94
EXTERIOR PAINT AND STAIN - FINAL	11JAN94	12JAN94
INTERIOR DOOR INSTALLING	12JAN94	12JAN94
VENETIAN BLINDS INSTALLING	12JAN94	12JAN94
GROUT CERAMIC TILE	12JAN94	12JAN94
SET UP DRIVES AND WALKS	13JAN94	13JAN94
INTERIOR PAINTING	13JAN94	14JAN94
POUR DRIVES AND WALKS	14JAN94	14JAN94
FENCING (IF NEEDED)	14JAN94	15JAN94
HVAC FINISH	15JAN94	15JAN94
CEILING FANS	15JAN94	15JAN94
ELECTRIC - FINISH	15JAN94	15JAN94
PLUMBING - FINISH	15JAN94	15JAN94
VINYL FLOOR INSTALLING	15JAN94	17JAN94
ENGINEERING INSPECTION	17JAN94	17JAN94
INSTALL CABINETS	18JAN94	18JAN94
BASE BOARDS	18JAN94	18JAN94
ENGINEERING INSECTION	18JAN94	18JAN94
TOUCH - UP PAINT AND CAULK	19JAN94	19JAN94
LANDSCAPE	20JAN94	20JAN94
PUNCH LIST	21JAN94	21JAN94
CLEAN - UP	22JAN94	22JAN94
APPLIANCES DELIVERED	24JAN94	24JAN94
REMOVE PORTA POTTY	24JAN94	24JAN94
FINAL INSPECTION FOR CO	25JAN94	25JAN94
REMOVE TEMPORARY POWER POLE	26JAN94	26JAN94
MOVE OUT	27JAN94	27JAN94


1993
1994
OCT
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JAN
1 8 15 22 29 6 13 20 27 3 10 17 24
10 SITE APPROVAL - BOARD
20 BOUNDARY SURVEY
30 CLOSE ON SITE
40 SITE PLAN APPROVAL
60 PORTA POTTY ORDERED
70 SEPTIC TANK PERMIT OR SEWER LOCA
50 BUILDING PERMIT APPROVAL
110 ORDER SEPTIC TANK
80 HVAC PERMIT PULLED
90 PLUMBING PERMIT PULLED
100 ELECTRIC PERMIT PULLED
120 APPLY FOR TEMPORARY ELECTRIC
150 SITE CLEAN UP
200 INSTALL SEPTIC TANK (IF NEEDED)
130 TEMPORARY POLE SET UP
160 LAYOUT AND STAKE
140 TEMPORARY ELECTRIC HOOKED UP
170 DIG FOOTERS
180 INSTALL REBAR
190 POUR FOOTER
220 CALL PLUMBER
230 STEM WALLS - BLOCK
240 BACKFILL AND GRADE FOR SLAB
250 PLUMBING - ROUGH - IN
270 TERMITE INJECTION
260 ORDER TRUSSES AND WINDOWS
280 PLASTIC AND WIRE MESH
290 SLAB POURED
300 LAYOUT FLOOR PLAN
310 FRAME WALLS
330 ORDER LANDSCAPE MATERIAL
340 ROOFING TRUSSES
370 WOOD SIDING
350 SUB - FACIA
360 ROOFING
390 EXTERIOR DOOR INSTALLATION
380 WINDOW INSTALLING
480 PLUMBING - INTERMEDIATE
490 HVAC - ROUGH - IN
500 ELECTRICAL AND PHONE - ROUGH - IN
510 WALL INSULATION
530 MARBLE SILL INSTALATION
391 TRIM
520 DRYWALL HANGING WALLS AND CEILINGS
400 EXTERIOR PAINT AND STAIN - PRIMER
540 FINISH DRYWALL AND CEILINGS
550 MEASURE FOR CABINETS AND ORDER
560 INTERIOR DOOR PREP
590 ORDER VENETIAN BLINDS AND APPLIANCES
600 CERAMIC TILE
620 ATTIC INSULATION
430 FINISH GRADING
730 EXTERIOR PAINT AND STAIN - FINAL
570 INTERIOR DOOR INSTALLING
690 VENETIAN BLINDS INSTALLING
700 GROUT CERAMIC TILE
440 SET UP DRIVES AND WALKS
580 INTERIOR PAINTING
450 POUR DRIVES AND WALKS
470 FENCING (IF NEEDED)
630 HVAC FINISH
640 CEILING FANS
650 ELECTRIC - FINISH
670 PLUMBING - FINISH
610 VINYL FLOOR INSTALLING
680 ENGINEERING INSPECTION
660 INSTALL CABINETS
710 BASE BOARDS
740 ENGINEERING INSECTION
720 TOUCH - UP PAINT AND CAULK
460 LANDSCAPE
750 PUNCH LIST
760 CLEAN - UP
770 APPLIANCES DELIVERED
780 REMOVE PORTA POTTY
790 FINAL INSPECTION FOR CO
800 REMOVE TEMPORARY POWER POLE
810 MOVE OUT

Plot Date 15JUL94
Data Date 30OCT93
Project Start 30OCT93
Project Finish 27JAN94

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Activity Bar/Early Dates
Critical Activity
Progress Bar
Activity Late Dates
Milestone/Flag Activity

HABT

Sheet 2 of 2

GENERIC SCHEDULE
HABITAT FOR HUMANITY
BAR CHART

PROJECT SCHEDULE

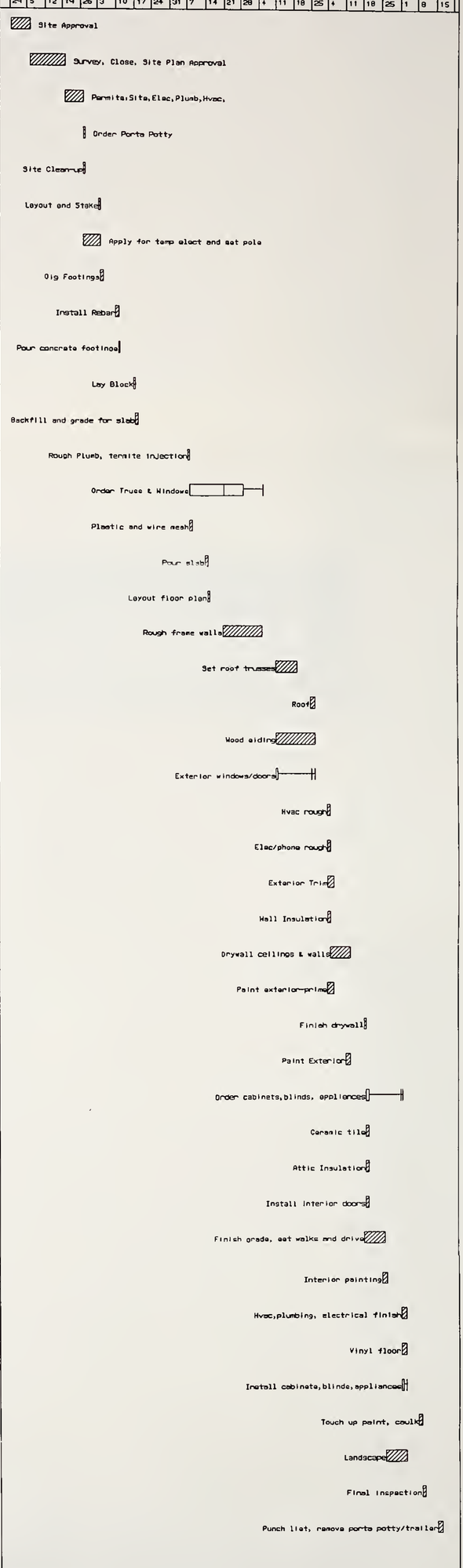
Date	Revision	Checked	Approved

SureTrak Project Scheduler

: Generic Habitat Schedule — RUN DATE: 17JUL94 — START DATE: 30OCT93
: — Rev 0 — FINISH DATE: 16APR94
E REPORT by ACTIVITY NUMBER — DATA DATE: ..... — CUTOFF DATE: .....

Y DESCRIPTION	REM DUR	PCT	----EARLY------ START	FINISH	----LATE------ START	FINISH	TF
Site Approval	2	0	30OCT93	05NOV93	30OCT93	05NOV93	0
Survey, Close, Site	4	0	06NOV93	19NOV93	06NOV93	19NOV93	0
Permits:Site,Elec,Pl	2	0	20NOV93	26NOV93	20NOV93	26NOV93	0
Order Porta Potty	1	0	27NOV93	27NOV93	27NOV93	27NOV93	0
Site Clean-up	1	0	27NOV93	27NOV93	27NOV93	27NOV93	0
Layout and Stake	1	0	03DEC93	03DEC93	03DEC93	03DEC93	0
Apply for temp elect	2	0	27NOV93	03DEC93	27NOV93	03DEC93	0
Dig Footings	1	0	04DEC93	04DEC93	04DEC93	04DEC93	0
Install Rebar	1	0	10DEC93	10DEC93	10DEC93	10DEC93	0
Pour concrete footin	1	0	11DEC93	11DEC93	11DEC93	11DEC93	0
Lay Block	1	0	17DEC93	17DEC93	17DEC93	17DEC93	0
Backfill and grade f	1	0	18DEC93	18DEC93	18DEC93	18DEC93	0
Rough Plumb, termite	1	0	07JAN94	07JAN94	07JAN94	07JAN94	0
Order Truss & Window	6	0	08JAN94	28JAN94	21JAN94	05FEB94	3
Plastic and wire mes	1	0	08JAN94	08JAN94	08JAN94	08JAN94	0
Pour slab	1	0	14JAN94	14JAN94	14JAN94	14JAN94	0
Layout floor plan	1	0	15JAN94	15JAN94	15JAN94	15JAN94	0
Rough frame walls	6	0	21JAN94	05FEB94	21JAN94	05FEB94	0
Set roof trusses	4	0	11FEB94	19FEB94	11FEB94	19FEB94	0
Roof	2	0	25FEB94	26FEB94	25FEB94	26FEB94	0
Wood siding	6	0	11FEB94	26FEB94	11FEB94	26FEB94	0
Exterior windows/doo	1	0	11FEB94	11FEB94	26FEB94	26FEB94	5
Hvac rough	1	0	04MAR94	04MAR94	04MAR94	04MAR94	0
Elec/phone rough	1	0	04MAR94	04MAR94	04MAR94	04MAR94	0
Exterior Trim	2	0	04MAR94	05MAR94	04MAR94	05MAR94	0
Wall Insulation	1	0	04MAR94	04MAR94	04MAR94	04MAR94	0
Drywall ceilings & w	3	0	05MAR94	12MAR94	05MAR94	12MAR94	0
Paint exterior-prime	2	0	04MAR94	05MAR94	04MAR94	05MAR94	0
Finish drywall	1	0	18MAR94	18MAR94	18MAR94	18MAR94	0
Paint Exterior	2	0	11MAR94	12MAR94	11MAR94	12MAR94	0
Order cabinets,blind	1	0	19MAR94	19MAR94	01APR94	01APR94	3
Ceraic tile	1	0	19MAR94	19MAR94	19MAR94	19MAR94	0
Attic Insulation	1	0	19MAR94	19MAR94	19MAR94	19MAR94	0
Install interior doo	1	0	19MAR94	19MAR94	19MAR94	19MAR94	0
Finish grade, set wa	3	0	18MAR94	25MAR94	18MAR94	25MAR94	0
Interior painting	2	0	25MAR94	26MAR94	25MAR94	26MAR94	0
Hvac,plumbing, elect	2	0	01APR94	02APR94	01APR94	02APR94	0
Vinyl floor	2	0	01APR94	02APR94	01APR94	02APR94	0
Install cabinets,bli	1	0	01APR94	01APR94	02APR94	02APR94	1
Touch up paint, caul	1	0	08APR94	08APR94	08APR94	08APR94	0
Landscape	3	0	26MAR94	02APR94	26MAR94	02APR94	0
Final inspection	1	0	09APR94	09APR94	09APR94	09APR94	0
Punch list, remove p	2	0	15APR94	16APR94	15APR94	16APR94	0
REPORT TOTALS	45	0					

ACTIVITY NUMBER	DESCRIPTION	REM DUR	EARLY START	EARLY FINISH	LATE START	LATE FINISH
10	Site Approval	2	30OCT93	05NOV93	30OCT93	05NOV93
12	Survey, Close, Site	4	06NOV93	19NOV93	06NOV93	19NOV93
14	Permits:Site,Elec,Pl	2	20NOV93	26NOV93	20NOV93	26NOV93
16	Order Ports Potty	1	27NOV93	27NOV93	27NOV93	27NOV93
18	Site Clean-up	1	27NOV93	27NOV93	27NOV93	27NOV93
20	Layout and Stake	1	03DEC93	03DEC93	03DEC93	03DEC93
22	Apply for temp elect	2	27NOV93	03DEC93	27NOV93	03DEC93
24	Dig Footings	1	04DEC93	04DEC93	04DEC93	04DEC93
26	Install Rebar	1	10DEC93	10DEC93	10DEC93	10DEC93
28	Pour concrete footin	1	11DEC93	11DEC93	11DEC93	11DEC93
30	Lay Block	1	17DEC93	17DEC93	17DEC93	17DEC93
32	Backfill and grade f	1	18DEC93	18DEC93	18DEC93	18DEC93
34	Rough Plumb, termite	1	07JAN94	07JAN94	07JAN94	07JAN94
36	Order Truss & Window	6	08JAN94	28JAN94	21JAN94	05FEB94
38	Plastic and wire mes	1	08JAN94	08JAN94	08JAN94	08JAN94
40	Pour slab	1	14JAN94	14JAN94	14JAN94	14JAN94
42	Layout floor plan	1	15JAN94	15JAN94	15JAN94	15JAN94
44	Rough frame walls	6	21JAN94	05FEB94	21JAN94	05FEB94
46	Set roof trusses	4	11FEB94	19FEB94	11FEB94	19FEB94
48	Roof	2	25FEB94	26FEB94	25FEB94	26FEB94
50	Wood siding	6	11FEB94	26FEB94	11FEB94	26FEB94
52	Exterior windows/doo	1	11FEB94	11FEB94	26FEB94	26FEB94
54	Hvac rough	1	04MAR94	04MAR94	04MAR94	04MAR94
56	Elec/phone rough	1	04MAR94	04MAR94	04MAR94	04MAR94
58	Exterior Trim	2	04MAR94	05MAR94	04MAR94	05MAR94
60	Wall Insulation	1	04MAR94	04MAR94	04MAR94	04MAR94
62	Drywall ceilings & w	3	05MAR94	12MAR94	05MAR94	12MAR94
64	Paint exterior-prime	2	04MAR94	05MAR94	04MAR94	05MAR94
66	Finish drywall	1	18MAR94	18MAR94	18MAR94	18MAR94
68	Paint Exterior	2	11MAR94	12MAR94	11MAR94	12MAR94
70	Order cabinets,blind	1	19MAR94	19MAR94	01APR94	01APR94
72	Ceramic tile	1	19MAR94	19MAR94	19MAR94	19MAR94
74	Attic Insulation	1	19MAR94	19MAR94	19MAR94	19MAR94
76	Install interior doo	1	19MAR94	19MAR94	19MAR94	19MAR94
78	Finish grade, set wa	3	18MAR94	25MAR94	18MAR94	25MAR94
80	Interior painting	2	25MAR94	26MAR94	25MAR94	26MAR94
82	Hvac,plumbing, elect	2	01APR94	02APR94	01APR94	02APR94
84	Vinyl floor	2	01APR94	02APR94	01APR94	02APR94
86	Install cabinets,bli	1	01APR94	01APR94	02APR94	02APR94
88	Touch up paint, caul	1	08APR94	08APR94	08APR94	08APR94
90	Landscape	3	26MAR94	02APR94	26MAR94	02APR94
92	Final inspection	1	09APR94	09APR94	09APR94	09APR94
94	Punch list, remove p	2	15APR94	16APR94	15APR94	16APR94



LS FLOAT — DESC

MILESTONE

CRITICAL

PROGRESS

PLANNED

RUN DATE	18JUN93
START DATE	30OCT93
DATA DATE	30OCT93
FINISH DATE	16APR94

Generic Bar Chart

Alachua Habitat for Humanity

SURETRAK

Generic Habitat Schedule

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NAVAL POSTGRADUATE SCHOOL

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